SEMESTER END EXAMINATION, APRIL-MAY, 2025

Course Name: - B.Tech. (ECE) **Semester:- IV**

Paper Name: - Microcontrollers **Paper Code:- TEC-403**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

Additional 30 Minutes for Mid-Test.

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

30 मिनट अतिरिक्त मिड–टेस्ट के लिए।

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **3 mark. All questions are compulsory.**
- Section B- Answer any **5 out of 7** given questions. Each question carries **7 marks.**
- Section C- Answer any **2 out of 3** given questions. Each question carries **10 marks.**
- Section D- Each question carries **02 mark**. All questions are compulsory.

Section – A (खण्ड–अ)

Objective Questions (वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. 5x3 =15

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Virtual memory is a technique:

A. To increase speed
B. To increase capacity
C. To execute large programs
D. All of the above

ii) For the 8085 assembly language program given below. Assume that the carry flag is initially unset (0). the content of the accumulator after the execution of the program is

```
MVI A, 07H
RLC
MOV B, A
RLC
RLC
ADD B
RRC
```

A. 8CH
B. 64H
C. 23H
D. 15H

iii) A key advantage of RISC over CISC is:

A. Larger instruction set
B. Simplified hardware and faster performance
C. Greater power consumption
D. Better floating-point support

iv) The 8279 chip is used for:

A. Analog interfacing
B. Math operations
C. Keyboard/display interface
D. Memory expansion

v) In 8086, the instruction "MOV AX, [1234H]" means:

A. Move data from 1234H to AX
B. Move data from AX to 1234H
C. Move immediate data 1234H to AX
D. None of the above

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions. **5x7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर दें।

i. Explain the concept of virtual and cache memory and how it improves system performance.

ii. Draw the architecture of the 8085 microprocessor and write its basic features.

iii. Describe how RISC and CISC architectures differ from each other with suitable diagram.

iv. Describe the block diagram of the 8051 microcontroller, focusing on its functional blocks.

v. Explain the complete timing diagram of the STA instruction in the 8085 microprocessor, detailing each machine cycle, control signals, and the flow of address and data.

vi. Explain the different types of addressing modes in the 8085 microprocessor with examples.

vii. Draw and explain the block diagram of 8253/8254 Programmable Interval Timer.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question. **2x10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर दें।

i) Explain memory segmentation techniques used in 8086 microprocessor and discuss their importance.

ii) Draw and explain the block diagram of 8255 Programmable Peripheral Interface (PPI) and write an assembly language program to configure Port A as output and Port B as input.

iii) Explain the basic building blocks of a microcomputer system. How do they interact with each other? In the fig.1, identify the addresses of the input and output ports.

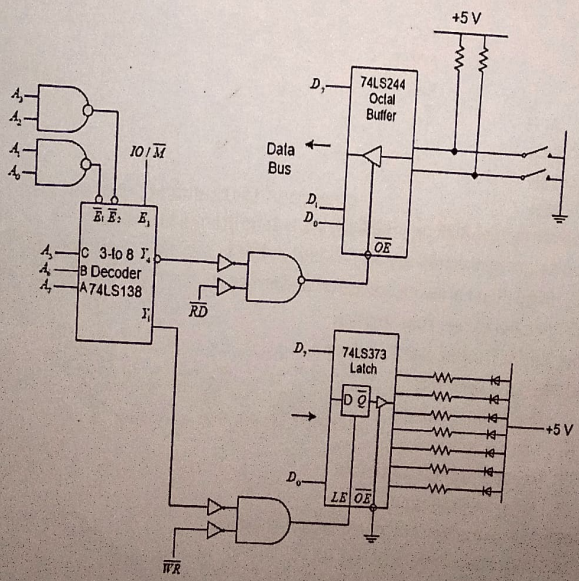

Fig.1

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Mid-Test

Course Name: - B.Tech. (ECE) **Semester:- IV**

Paper Name: - Microcontrollers **Paper Code:- TEC-403**

Time - 30 minutes. **Max Marks-20**

All questions are compulsory. **2×10=20**

सभी प्रश्न अनिवार्य हैं।

Objective Questions.

बहुविकल्पीय प्रश्न।

1. **The function of ALE (Address Latch Enable) is to:**
   - A. Enable the accumulator
   - B. Store control signals
   - C. Separate address and data
   - D. Control the clock
2. **A timer in microcontroller is used to:**
   - A. Measure time delay
   - B. Generate PWM
   - C. Count external events
   - D. All of the above
3. **Cache memory is:**
   - A. Non-volatile
   - B. Slow memory
   - C. High-speed memory between CPU and RAM
   - D. External to CPU
4. **RISC stands for:**
   - A. Rapid Instruction System Computer
   - B. Reduced Instruction Set Computer
   - C. Recursive Instruction Set Compiler
   - D. Repetitive Instruction System Code
5. **The primary role of the control unit in a microprocessor is to:**
   - A. Perform arithmetic operations
   - B. Store data
   - C. Decode instructions and control execution
   - D. Connect peripherals
6. **Which flag is not available in 8085?**
   - A. Carry Flag
   - B. Zero Flag
   - C. Parity Flag
   - D. Overflow Flag
7. **Which port of 8051 can also serve as higher address bus?**
   - A. Port 0
   - B. Port 1
   - C. Port 2
   - D. Port 3
8. **Which of the following pins are used for serial communication in 8051?**
   - A. P3.0 and P3.1
   - B. P3.2 and P3.3
   - C. P3.4 and P3.5
   - D. P3.6 and P3.7

9. **What is the content of accumulator of 8085 microprocessor after the execution of XRI 0FH instruction?**

A. Clear the lower four bits of the accumulator in 8085.

B. Complement the lower four bits of the accumulator in 8085.

C. Clear the upper four bits of the accumulator in 8085.

D. Complement the upper four bits of the accumulator in 8085.

10. **Accumulator has data FFH. Determine the state of CY,Z and sign flag when 01H is added**

A. CY=0, S=0, Z=1

B. CY=1, S=0, Z=1

C. CY=0, S=0, Z=0

D. CY=1, S=0, Z=0

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